

**From:** [Angela Carpenter](#)  
**To:** [Mel Hauptman](#)  
**Subject:** Fw: New RI/FS WA --Cabo Rojo GW site ----Information needed for COI check  
**Date:** 01/31/2011 07:20 AM  
**Attachments:** [matteo-RIFS.doc](#)

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Fyi

▼ [Courtney McEnery](#)

----- Original Message -----

**From:** Courtney McEnery  
**Sent:** 01/28/2011 02:27 PM EST  
**To:** Angela Carpenter  
**Subject:** Fw: New RI/FS WA --Cabo Rojo GW site ----Information needed for COI check

Forgot to cc you since I think one of the sites is going in to your section? Do we want CDM to do the work?

Thanks. Courtney

----- Forwarded by Courtney McEnery/R2/USEPA/US on 01/28/2011 02:26 PM -----

**From:** Courtney McEnery/R2/USEPA/US  
**To:** "John LaPadula" <LaPadula.John@epamail.epa.gov>  
**Date:** 01/28/2011 09:03 AM  
**Subject:** Fw: New RI/FS WA --Cabo Rojo GW site ----Information needed for COI check

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Are we sending both PR sites to CDM?  
Sent by EPA Wireless E-Mail Services

▼ [Helen Eng](#)

----- Original Message -----

**From:** Helen Eng  
**Sent:** 01/28/2011 08:33 AM EST  
**To:** Denise Zeno  
**Cc:** Courtney McEnery  
**Subject:** New RI/FS WA --Cabo Rojo GW site ----Information needed for COI check  
Denise

Attached is a RI/FS SOW that you can use for an example, you will also need to provide IGCE assumptions for the project. --Has money been allocated for this project???



Could you please provide the information below on your site to start the COI process.

Site Name:

Site Address:

Some basic history & Purpose of the WA - for example, facility operated as a rubber manufacturer from years 1890 - 1990, during this period .....

-- can get this information from the pre-remedial information/reports.....

Purpose of this WA is to perform the RI/FS for OU #1 .....

Potential Responsible Parties - list any known parties and potential parties.

Thanks, Helen

**STATEMENT OF WORK  
REMEDIAL INVESTIGATION/FEASIBILITY STUDY  
MATTEO & SONS, INC. SITE  
THOROFARE, GLOUCESTER COUNTY, NEW JERSEY**

**Introduction**

This statement of work describes the Government's requirements for performance of a Remedial Investigation and Feasibility Study (RI/FS) to investigate the overall nature and extent of contamination and develop remedial alternatives at the Matteo & Sons, Inc. ("the Site"), Thorofare, New Jersey. The contractor shall perform this RI/FS pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA), and the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (U.S. Environmental Protection Agency, October 1998).

The Remedial Investigation will characterize the nature and extent of the risks associated with the contamination at the site, and includes (1) collection of data and information necessary to characterize the nature and extent of contamination at the site and assess the risk to human health and the environment, and (2) a determination of whether the contamination presents a significant risk to human health or the environment. The Feasibility Study will develop and analyze a range of remedial action alternatives through the application of established evaluation criteria, to facilitate selection of the remedy.

**Site Description**

The Matteo & Sons, Inc. site is located at 1708 U.S. Highway 130 (a.k.a Crown Point Road) in Thorofare, Gloucester County, New Jersey and is situated just west of Interstate Highway 295/Route 130. The eastern portion of the site, approximately 5 acres, is partially paved with asphalt and contains several buildings that support an active scrap metal recycling business. The remainder of the site, approximately 75 acres, is comprised predominantly of heavily vegetated, undeveloped land that is bordered by Woodbury Creek to the west, Hessian Run to the north, and a residential trailer park to the south. At least 100 hundred trailers are present in the park. A residence and an automobile repair shop are situated to the east and southwest of the scrap yard, respectively. Two buried utility lines pass through the northwestern portion of the site.

The location of this site is approximately 1.2 miles from the Delaware River, at the confluence of Woodbury Creek and Hessian Run. According to the Remedial Investigation (RI) and Remedial Action Selection Evaluation completed by the New Jersey Department of Environmental Protection (NJDEP) in May 2004, the tidal fluctuations range from approximately 5.4 feet at neap tides to approximately 6 feet at spring tides. Tidal currents are strong in this area. At low tide, Woodbury Creek is ten feet deep, and Hessian Run becomes a narrow stream less than a foot deep. Based on floodplain data, at least two-thirds of the site is situated within the 100-year floodplain at nine feet above mean sea level. The flood conditions which occurred in April 2005 were commensurate with this type of inundation. Woodbury Creek has one of the largest remaining tidal freshwater wetlands on the Delaware River. The site is situated in the Woodbury-Hessian Run marshes, which are freshwater tidal marshlands. The tidal marshes are flat and regularly flooded by slightly brackish tides. These marshes are considered to be part of the Delaware River estuary. Both the NJDEP Freshwater Wetland Map and the National Wetland Inventory (NWI) Mapping identify wetland habitats in and around the site. The tidal reach of the Delaware River is part of the National Estuary Program, a program set up to protect estuarine systems of national significance.

The site provides a habitat for a variety of wildlife species, due to the diversity of habitat types present and its location adjacent to a freshwater tidal marsh. The marshes provide habitat for muskrat, ducks and geese. According to the RI, numerous fish species have been identified in Woodbury Creek and Hessian Run; according to the Atlantic Coast Ecological Inventory, the Delaware River estuary contains game fish such as the American shad and striped bass. The osprey and bald eagle are bird species that were observed at the site during the NJDEP RI.

The business operations and waste disposal practices at the site were mechanisms for past releases to the environment. Metals, lead in particular, were recovered from batteries and wiring since the 1950's. Sources of contamination onsite

include an approximately 224,000 square-foot pile of crushed battery casings, an approximately 260,000 square-foot inactive landfill in the north-central portion of the site, and lead- and PCB-contaminated soil located throughout the property. The crushed battery casings have been deposited directly into the Hessian Run, as well as into the wetlands along the Hessian Run, altering the shoreline. Lead and PCBs have been found at levels significantly above New Jersey Residential Soil Cleanup Criteria (NJRSCC) in the surface soils onsite, and significantly above background levels in sediments. Lead is also a concern in surface water and groundwater at the site.

Both Hessian Run and Woodbury Creek are tidal, and flood the site during elevated flows on the Delaware River. During low tide, contaminated stored water from the battery casing area flows over the exposed wide mud flats. The flood waters that pass over the site tend to cause migration of contaminants from the highly contaminated areas into the adjacent creeks and other portions of the site. Flooding of this nature occurred in April 2005, during a period of heavy rainfall and snow melt in the Delaware River basin. Since the site is accessible and is used for recreational purposes, the potential exists for direct contact with the contaminated soil and crushed battery casings, which could potentially lead to exposure through inhalation and ingestion.

Currently, Matteo & Sons operates a scrap metal recycling facility on a portion of the site closest to Crown Point Road. According to a recent price sheet, the company accepts copper, brass, aluminum, stainless steel, iron, lead, motors, junk cars and batteries. The batteries, which allegedly are a very small part of the business since they are not assigned any value, are reportedly shipped off as received without any lead recovery. A portion of the scrap yard is paved near the entrance and the weigh station; the remainder of the scrap yard is unpaved. Soil contamination has been documented in the unpaved portion of the scrap yard. The remainder of the site west of the scrap yard is not currently used.

The scrap recycling facility receives metal from customers who drive onto the pavement on the eastern portion of the scrap yard and then onto a weight scale. Customers drop off metal at various locations in the yard, depending on the type of material being delivered and its designated collection point at the facility. Based upon site observations, soil was apparently being transferred by vehicle tracking from the unpaved portion of the yard to the paved areas leading towards the entrance of the facility, indicating the potential for off-site migration and generation of dust in this operation during dry weather conditions.

Trails leading from off-site areas are present throughout the site. There are at least seven established trails in the southern portion of the site. Most of these trails lead directly to or near the trailer park. In addition, the central portion of the site where the crushed battery casings are landfilled is accessible from the rear of the scrap yard. Aside from some of the dump areas, the landfill and the trails, most of the site is heavily vegetated. Crushed casings were present inland along the northern portion of the site.

Groundwater is the source of drinking water within a four-mile radius of the site. Municipal wells provide the vast majority of potable water. There are three private water supply wells in the immediate area of the site: the scrap yard, the residence located next to the scrap yard to the east, and the automobile repair shop located next to the scrap yard to the southwest. The latter of these wells is 103 feet in depth, while the depth of the other wells is not known. It is reported that the wells at the scrap yard and the adjacent automobile repair shop are not used for potable water. The residential well is used for potable water and has a treatment system. There are also three municipal wells located within one mile of the site.

The groundwater table is approximately ten feet below the ground surface at the site. According to the NJDEP RI, the primary flow of the ground water is towards the southeast. A perched water table exists in the eastern portion of the site. On the far eastern edge of the site, the perched water flows to the north into Hessian Run. The remainder of the perched water flows towards the center of the site, and connects with the regional ground water flow heading towards the southeast.

## **Site History**

The Matteo family acquired the property on which the site is located in 1947, and reportedly operated a junkyard, recycling facility, and an unregistered landfill since approximately 1961. The NJDEP identified an inactive incinerator at the site in 1968. The unregistered landfill accepted crushed automotive battery casings and industrial and domestic waste. In 1971, the NJDEP approved a request from the facility to operate the incinerator to burn copper wire, and received a plan from the facility for a “sweating fire box” to melt lead battery terminals for lead reclamation. An inspection in 1974 revealed that the approved incinerator was being used to smelt battery parts. The lead melting operation continued until 1985. In 1972, the NJDEP observed landfilling of crushed battery casings in a wetlands area adjacent to Hessian Run. This operation was apparently performed in conjunction with the lead melting operation, as there were several reports of incineration of battery casings and subsequent on-site disposal of ash and waste products. At one time, the owner claimed that the crushed battery casings were intended for sale, for use in road projects, driveways, and other recycling uses. In 1976 and 1984, there were reports of fires burning at the landfill, involving the waste material placed there. It was reported that the fire burned for three days during the 1976 period. In addition to these operations, numerous inspections and complaints through the years revealed drums of waste scattered throughout the property, including in the wooded area near the trailer park.

The NJDEP has been involved with the site since at least 1972, with inspections of the landfill and melting operations. An Administrative Order was issued to the company in 1984, with respect to their waste disposal practices for incinerator ash, a pile of white powder, and drums. The company was issued a Notice of Violation (NOV) in 1991 for significant amounts of solid waste and other materials of environmental concern, and subsequently conducted a site investigation. This investigation, which included test pits, revealed elevated levels of lead and total petroleum hydrocarbons at the site. The case was transferred to the NJ Division of Publicly-Funded Site Remediation in 1993, after the company did not conduct any of the required follow-up investigative activities or proceed with closure of the landfill. The NJDEP conducted a PA/SI in 1996. In July 1997, the NJDEP conducted sampling of surface soils to determine the extent of PCB contamination and whether dioxin was present at the site. Analytical results did not confirm the presence of dioxin.

The NJDEP announced an initiative on April 25, 2005 for accelerating the cleanup of ten major contaminated sites along the Delaware River, in an effort to improve the quality of the river. The Matteo Iron and Metal site was identified on this list.

In February 2005, the EPA Region 2 ERRD Removal Action Branch (RAB) received a request from NJDEP to assess the site for a potential removal action. EPA subsequently received information from NJDEP concerning the contamination at the site. On June 6, 2005, NJDEP submitted a written request to EPA to consider the site for a CERCLA removal action.

During the period April 27-29, 2005, EPA personnel and contractor representatives from the Removal Support Team (RST) and the Site Assessment Team (SAT) conducted a sampling event at the site in support of an Integrated Assessment (IA). This effort covered the collection of 82 surface soil samples from the site, the adjacent trailer park, and the adjoining residence east of the scrap yard. Several site visits were conducted by RAB between March and April 2005. RAB personnel observed that the active scrap yard is only fenced on the eastern boundary along Crown Point Road and a portion of the northeast corner. Under a May 2006 Administrative Order of Consent, Matteo & Sons constructed a high-visibility fence, and instituted engineering controls to prevent access to contaminated site areas.

### **Site Investigations**

During the RI investigation performed by the NJDEP, the analytical data revealed elevated levels of lead in the soil throughout the battery casing burial area, the scrap yard, and the adjoining creek sediments around the site. Additionally, there are separate spots of soil contamination throughout the site. PCBs, antimony, copper, arsenic, cadmium, mercury, nickel and zinc were also detected at some locations, at levels above NJDEP Nonresidential Direct Contact Soil Cleanup Criteria (NRDCSCC) and Residential Direct Contact Soil Cleanup Criteria (RDCSCC). There were also sporadic detections of polyaromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs) in the shallow subsurface soil. Soil sampling conducted in the unpaved portion of the scrap yard indicated the presence of elevated levels of lead, especially in the central area just northwest and west of the pavement.

According to estimates in the NJDEP RI, approximately 75% of the six-acre scrap yard is above the NJDEP RDCSCC for lead (400 mg/kg). Soil samples collected from the 90 test pits throughout the site during the RI indicated a maximum lead concentration of 31,300 mg/kg within the buried waste at a depth of 1.5 feet, and 11,500 mg/kg below the waste at a

depth of five feet. A test pit along the western boundary of the site indicated PCBs at a concentration of 460 mg/kg at a depth of 4.5 feet, and xylene at a concentration of 280 mg/kg at a depth of 3 feet.

During the NJDEP RI, sediment samples were collected to a depth of three feet from Hessian Run and Woodbury Creek. Lead concentrations in sediment samples exceeded the NJDEP Sediment Quality Criteria Severe Effect Level (SEL) of 250 mg/kg at all of the sampling locations along Hessian Run, with the most contaminated area generally being closest to the central portion of the north shoreline of the site.

The NJDEP Sediment Quality Criteria Lowest Effect Level (LEL) of 31 mg/kg for lead was exceeded at all locations sampled. The concentrations of lead in the sediments generally decrease with distance from the north shoreline. PCB concentrations in sediment samples exceeded the SEL (these vary based on total organic carbon concentrations) at two locations in Hessian Run. Arsenic, copper, and zinc also exceeded their respective SELs in Hessian Run near the creek bank.

Surface water samples collected from locations in both Hessian Run and Woodbury Creek during the RI indicated the presence of lead above NJDEP Surface Water Quality Standards (SWQS) ecological criteria (2.5 ug/l), and above SWQS human criteria (5 ug/l). The highest lead concentration detected was 87.4 ug/l.

As part of the RI, the NJDEP completed an ecological study in the summer of 2003, and issued the Final Aquatic Biota Study in December 2004. NJDEP collected sediment and water samples from ten stations upstream, adjacent to, and downstream of the site, covering both Hessian Run and Woodbury Creek. The highest sediment concentrations of lead and PCBs, 19,600 mg/kg and 35 mg/kg, respectively, were confirmed in Hessian Run at adjacent stations near the central portion of the burial area.

Groundwater monitoring conducted at the site indicated the presence of lead (6,050 ug/l), nickel (174 ug/l), chromium (164 ug/l), and cadmium (4.4J) in the shallow monitoring wells. Vinyl chloride has been identified in the deep monitoring wells at concentrations as high as 20 ug/l.

In May 2004, the NJDEP installed four monitoring wells east of Interstate 295. Three of the wells are located within 0.3 miles of the site and range in depth from 79 to 92 feet. The highest level of vinyl chloride identified in the off-site monitoring wells is 26 ug/l. Lead was detected in the on-site potable well in 1994 at 57 ug/l. Vinyl chloride has been detected at a maximum concentration of 4.8 ug/l in the potable well of the adjacent tire business. Neither of these wells are reportedly used for potable water.

The surface soil sampling conducted by EPA within the landfill area during April 2005 generally confirmed the previous sample results concerning lead contamination in the landfill and battery casing burial areas. The soil samples collected in an area of the site near the trailer park border did not confirm a previous detection of lead at 14,500 mg/kg. The maximum XRF lead concentration from four samples collected in this general area was 277 mg/kg. Three samples collected from lawns in the trailer park, just south and southeast of this area, detected lead at estimated laboratory concentrations of 1,520 mg/kg, 973 mg/kg, and 410 mg/kg. The XRF screening results for these samples were 906 mg/kg, 715 mg/kg and 306 mg/kg, respectively. The lead concentrations within the remainder of the trailer park were all below 200 mg/kg. The four samples collected from the curb on Crown Point Road, outside of the scrap yard entrance, and on a dirt roadway which separates the scrap yard and the residence located east of the scrap yard, were all below a lead concentration of 400 mg/kg. A sample collected from the eastern lawn of this residence detected lead at an estimated laboratory concentration of 1,400 mg/kg. With respect to PCBs, one sample collected near Hessian Run from inside a crushed battery burial area indicated the presence of PCB Aroclor-1254 at an estimated concentration of 200 mg/kg.

## **Purpose**

The purpose of this statement of work (SOW) is to describe the requirements for conducting a Remedial Investigation/Feasibility Study (RI/FS) to select a remedy to eliminate, reduce, or control risks to human health and the

environment at the Matteo & Sons, Inc. site. This SOW is designed to provide the framework for conducting the RI/FS activities at the site. The objective of this RI/FS is to review and evaluate the studies and investigations performed at the site to date, determine the minimum amount of sampling data necessary to complete characterization of the site and support the selection of an approach for site remediation, and to use this data in support of a Record of Decision (ROD) within approximately eighteen months after approval of the work plan. The estimated completion date for this work assignment is September 30, 2011.

## **General Requirements**

The contractor shall perform the RI/FS in accordance with this SOW and all other relevant guidance used by EPA in conducting an RI/FS. The contractor shall furnish all necessary and appropriate personnel, materials, and services needed for, or incidental to, performing and completing the RI/FS. In all cases, the contractor shall use the most recently issued guidance.

Attachment 1 of this SOW is a summary and prospective schedule for submittal of the major deliverables. A final schedule for submittal of these deliverables will be established as part of the approved work plan for this RI/FS.

EPA will monitor and oversee contractor activities throughout the RI/FS. EPA will review all deliverables prior to acceptance to determine whether the performance requirements of this work assignment have been met, and to assess the likelihood that the RI/FS will achieve its goals. Acceptance of deliverables by EPA does not relieve the contractor of responsibility for the adequacy of the deliverables in accordance with contract requirements.

The contractor shall communicate at least weekly with the Work Assignment Manager (WAM), either in face-to-face meetings or through conference calls. The contractor shall notify EPA when 75 percent of the expenditure limit has been expended, and provide a project estimate at completion, in accordance with Clause B.9, "Special Limitation of Cost Provision for Work Assignments."

## **Green Remediation**

"Green Remediation" is the practice of considering all environmental effects of the implementation of a remedy and incorporating options to maximize the net environmental benefit of cleanup actions. In accordance with EPA's strategic plan for compliance and environmental stewardship, the Agency strives for cleanup programs that use natural resources and energy efficiently, reduce negative impacts on the environment, minimize or eliminate pollution at its source, and reduce waste to the maximum extent possible. The EPA Region 2 Superfund program supports the adoption of "green site assessment and remediation," which is defined as the practice of considering all environmental impacts of studies, selecting and implementing a given remedy, and incorporating strategies to maximize the net environmental benefit of cleanup actions (see <http://www.clu-in.org/greenremediation>).

On March 17, 2009, Region 2 established a "[Clean & Green](#)" policy to enhance the environmental benefits of Superfund cleanups by promoting technologies and practices that are sustainable. This policy applies to all Superfund cleanup projects, and is available at [http://www.epa.gov/region02/superfund/green\\_remediation/policy.html](http://www.epa.gov/region02/superfund/green_remediation/policy.html). Region 2's "Clean and Green Policy" calls for the contractor, at a minimum, to purchase 100 percent of the electricity for this project from renewable sources and use clean diesel fuels and technologies during the performance of this work assignment. Under this policy, certain green remediation technologies will serve as touchstones for Region 2 response actions. The Region 2 "touchstone technologies" include:

[Use of 100% of electricity from renewable sources](http://www.epa.gov/osw/partnerships/c2p2/index.htm) <http://www.epa.gov/osw/partnerships/c2p2/index.htm>  
[Concrete made with Coal Combustion Products \(CCP\) replacing a portion of traditional cement](#)  
[Clean diesel fuels and technologies](http://www.epa.gov/lmop/overview.htm) <http://www.epa.gov/lmop/overview.htm> - methane  
[Methane capture at landfill sites](#)  
[http://apps3.eere.energy.gov/greenpower/buying/buying\\_power.shtml](http://apps3.eere.energy.gov/greenpower/buying/buying_power.shtml)  
<http://www.epa.gov/oms/retrofit/nonroad-list.htm>

To the extent practicable, the contractor shall explore and implement green remediation strategies and applications in the performance of the requirements of this work assignment to maximize sustainability, reduce energy and water usage, promote carbon neutrality, promote industrial materials reuse and recycling, and protect and preserve land resources. The contractor shall present green remediation options and approaches in its work plans, provide cost analyses for these options in its work plan budgets, maintain records of “green-related” activities, and report this information to EPA in its monthly progress reports or as requested by the Project Officer.

The following guidance documents provide additional information regarding the implementation of “Green Remediation” practices:

- Attachment 2, “Green Remediation Practices”
- Federal Acquisition Regulation, Part 23, “Environment, Energy and Water Efficiency, Renewable Energy Technologies, Occupational Safety, and Drug-Free Workplace:” FAR Subparts 23.2, 23.4, 23.7, and 23.8 (see <http://www.arnet.gov/far/05-23-1/html/FARTOCP23.html>)
- Executive Order 13423, “Strengthening Federal Environmental, Energy, and Transportation Management” (January 2007) (see <http://www.epa.gov/oaintnrt/practices/eo13423.htm>)

### **Electronic Data Deliverable (EDD) Requirements**

Region 2 has adopted the standardized electronic data deliverable (EDD) format in order to streamline the electronic submittal of environmental sampling data. The EDD format is required for all new and historic data submitted to the Region. The contractor shall provide electronic submittal of field sampling and laboratory analytical results, geologic data, and well location data in accordance with Region 2’s policies, guidelines, and formats.

Region 2’s “Comprehensive Electronic Data Deliverable Specification Manual 1.4” (July 2009) explains the systematic implementation of EDD within Region 2, and provides detailed instructions of data preparation and identification of data fields required for data submissions. Additional Region 2 EDD guidance and requirements documents, including the “Electronic Data Deliverables Valid Values Reference Manual” and tables, the “Basic Manual for Historic Electronic Data,” the “Standalone EQuIS Data Processor User Guide,” and EDD templates, can be found at <http://www.epa.gov/region02/superfund/medd.htm>.

### **EPA Primary Contact**

The primary contact for this work assignment is Larry Granite, the Work Assignment Manager (WAM). He can be reached at phone number (212) 637-4423 by fax at (212) 637-3699, or by e-mail at [granite.larry@epa.gov](mailto:granite.larry@epa.gov). The secondary contact is Helen Eng, the Deputy Project Officer. She can be reached at phone number (212) 637-4348, by fax at (212) 637-3083, or by e-mail at [eng.helen@epa.gov](mailto:eng.helen@epa.gov).

### **Record-Keeping Requirements**

The contractor shall maintain all technical and financial records for this RI/FS work assignment in accordance with the requirements of this contract and the technical direction of the EPA WAM. These technical and financial records must be in sufficient detail to support decisions made during the RI/FS as well as cost recovery actions. At the completion of the RI/FS, the contractor shall submit one copy of the major deliverables in electronic format (Word, Excel, and/or PDF, as applicable) to the EPA WAM, with one copy to the EPA Records Manager, pursuant to the requirements of Clause D.1, “Electronic Submission of Deliverables.”

### **Project Closeout**

At the completion of this work assignment, the contractor shall perform all necessary project closeout activities as specified in the contract. These activities shall include closing out subcontracts, indexing and consolidating project records and files and providing a technical and financial closeout report to EPA. Final costs shall be reported to EPA in

electronic format, broken down by cost element for each subtask of the Work Breakdown Structure (WBS) identified in this SOW.

## **Task 1 Project Planning and Support**

### **1.1 Project Administration**

The contractor shall provide the following project administration support in the performance of this work assignment:

Contractor site manager (SM) activities under project administration shall include:

- Preparation of the technical monthly progress report
- Review of weekly financial reports
- Review and update project schedule
- Weekly communication with EPA WAM
- Prepare staffing plans

Program support personnel activities under project administration shall include:

- Preparation of work assignment technical/financial status reports for the monthly progress report
- Technical resource management
- Review of work assignment budget status
- Respond to questions from the EPA PO and CO
- Preparation of monthly invoices

### **1.2 Scoping Meeting - *Not Applicable***

### **1.3 Conduct Site Visit**

The contractor shall conduct a 1-day site visit during the project planning phase to develop a conceptual understanding of the site and the RI/FS scope and requirements.

### **1.4 Develop Draft Work Plan and Associated Cost Estimate**

The contractor shall update the RI/FS work plan dated December 14, 2007, prepared under Work Assignment 172-RICO-02KD of Contract 68-W-98-210, and prepare an updated full budget for this RI/FS in accordance with contract requirements. The contractor shall use information from the appropriate EPA guidance referenced in this SOW and technical direction provided by the EPA WAM as the basis for preparing the RI/FS work plan and budget. General requirements for preparation of work plans and work plan budgets are described in Section 8.0 of Attachment B, "Reports of Work."

The updated RI/FS work plan shall include a comprehensive description of project tasks, the procedures to accomplish them, project documentation, and a proposed project schedule. The contractor shall use its approved quality assurance/quality control (QA/QC) systems and procedures to assure that the work plan and other deliverables are of professional quality. The work plan shall include the following:

- Identification of RI/FS project elements including planning and activity reporting, field sampling and analysis, and treatability study activities. The contractor shall implement a detailed work breakdown structure for the RI/FS in accordance with the work breakdown structure in this statement of work.
- The contractor's technical approach to each task to be performed, including a detailed description of each task; the assumptions used; any information to be produced during and at the conclusion of each task; and a description of the work products that will be submitted to EPA. Information shall be presented in a sequence

consistent with this SOW.

- A proposed schedule showing specific dates for completion of each required activity and submission of each deliverable required by this SOW. This schedule shall also include information regarding timing, initiation, and completion of all critical path milestones for each activity and deliverable and the anticipated review time for EPA.
- Address site access, security, contingency procedures, management responsibilities and how investigation-derived wastes (IDW) are to be stored and disposed of.
- A list of key contractor personnel providing support on the work assignment.

In conjunction with preparation of the draft work plan, the contractor shall prepare and submit a draft work plan budget. This work plan budget shall follow the work breakdown structure for this assignment as indicated in the statement of work, and shall contain a detailed cost breakdown, by subtask, of the direct labor costs, subcontract costs, "other direct" costs, projected base fee and award fee pool, and any additional specific cost elements required for performance of each of the subtasks under this statement of work. "Other direct" costs shall be broken down into individual cost categories as required for this work assignment, based on the specific cost categories negotiated for this contract. The work plan budget shall contain a detailed rationale describing the contractor's assumptions for estimating the level of effort (including professional/technical levels and skill mix), subcontract amounts, and "other direct" cost amounts for each subtask under this SOW.

#### 1.5 Negotiate and Prepare Final Work Plan/Budget

The contractor shall participate in a work plan negotiation meeting at the Region 2 New York office in person or via teleconference. EPA and the contractor will discuss and negotiate the costs required to accomplish the tasks described in the final work plan implementing the requirements of this SOW. The contractor shall submit a final work plan incorporating all EPA review comments and a final work plan budget incorporating the agreements made in the negotiations. The final work plan budget shall include a summary of the negotiations. The contractor shall submit the revised work plan and budget in both hardcopy and electronic formats.

#### 1.6 Evaluate Existing Data and Documents

The contractor shall research and review available background information and documentation pertaining to the site, including all studies and investigations performed at the site, as provided or identified by the EPA WAM. As part of this effort, the contractor shall evaluate the following documents:

- Files and records from EPA Removal Action Branch
- Other EPA files and records
- NJDEP RI/FS files and records
- NJDEP Final Aquatic Biota Study files and records
- PRP files and records

#### 1.7 Quality Assurance Project Plan

The contractor shall prepare a Quality Assurance Project Plan (QAPP) in accordance with the "EPA Requirements for Quality Assurance Project Plans (EPA QA/R-5)" (EPA/240/B-01/003, March 2001; reissued May 2006), the "Uniform Federal Policy for Quality Assurance Project Plans" (EPA-505-B-04-900A, March 2005), current EPA Region 2 RAC QAPP guidance and procedures, and the contractor's current approved quality management plan for this contract. The QAPP shall be submitted as an appendix to the RI/FS work plan to facilitate review and approval.

The QAPP is a comprehensive document combining information previously provided under two separate documents, the Quality Assurance Project Plan (QAPP) and the Sampling and Analysis Plan (SAMP). The QAPP shall describe the project objectives and organization, functional activities, and quality assurance/quality control (QA/QC) protocols that will be used to achieve the desired Data Quality Objectives (DQOs). The DQOs shall, at a minimum, reflect use of analytical methods for identifying and addressing contamination consistent with the levels for remedial action objectives identified in the National Contingency Plan.

In addition, the QAPP shall describe the number, type, and location of samples and type of analyses to be performed. The QAPP shall include sampling objectives, sample locations and frequency, sampling equipment and procedures, sample handling and analysis, and a breakdown of samples to be analyzed through the Contract Laboratory Program (CLP) and other sources, as well as the justification for these decisions. The QAPP shall consider the use of all existing data and shall justify the need for additional data whenever existing data will meet the same objective. The QAPP shall be written so that a field sampling team unfamiliar with the site would be able to gather the necessary samples and field information in accordance with EPA Region 2's quality assurance requirements. The contractor shall document any required changes to the QAPP in a letter to the EPA WAM and QAO.

#### 1.8 Health and Safety Plan

The contractor shall prepare a site-specific Health and Safety Plan (HASP) that specifies employee training, protective equipment, medical surveillance requirements, standard operating procedures and a contingency plan in accordance with 40 CFR 300.150 of the NCP and 29 CFR 1910.120 (l)(1) and (l)(2). The HASP shall be submitted as an appendix to the work plan to facilitate document review and approval.

#### 1.9 Non-RAS Analyses

At the direction of EPA, the contractor shall develop an EPA-approved laboratory quality assurance program that provides oversight of in-house and subcontracted laboratories through periodic performance evaluation sample analyses and/or on-site audits of operations, and prescribes a system of corrective actions to be implemented in cases where the laboratory's performance does not meet the standards of this program. This will include at a minimum:

- Prepare Laboratory Services Requests (e.g., statements of work) for all non-RAS parameters. The Laboratory Services Request(s) shall include the following elements:
  - digestion/analytical methods
  - data deliverable requirements
  - quality control (QC) requirements
  - estimated number of samples
  - method restrictions and penalties for non-compliance
  - turn-around times
- Develop QC criteria for each parameter of the approved site-specific or contract-wide QAPP that will be incorporated into the Laboratory Service Request.
- The contractor shall comply with all applicable and appropriate requirements in the acquisition and management of subcontracts for analytical services, including the requirements, terms, and conditions of this contract; the subcontractor's corporate standard operating procedures; and the applicable requirements of the Federal Acquisition Regulation (FAR), Environmental Protection Agency Acquisition Regulation (EPAAR), and other relevant Federal and Agency acquisition requirements.
- At the request of the EPA WAM, the contractor shall submit the Laboratory Services Request for EPA review prior to solicitation of an analytical services subcontract.

#### 1.10 Meetings

The contractor shall participate in progress meetings during the course of the work assignment. For budgeting purposes, the contractor shall assume 8 meetings, with 2 people in attendance. The contractor shall prepare minutes of each meeting for review by the EPA WAM.

#### 1.11 Subcontract Procurement

The contractor shall identify, solicit, and award the subcontracts necessary to perform the requirements of this statement of work. The contractor shall describe the subcontracts needed for this RI/FS as part of its work plan and budget. All subcontract procurement activities shall be performed under this subtask.

#### 1.12 Perform Subcontract Management

The contractor shall perform management and oversight of any subcontract(s) needed for RI/FS activities. The contractor shall institute procedures to monitor progress, and maintain systems and records to ensure that the work proceeds in accordance with the requirements of this work assignment and the contract. The contractor shall review and approve subcontractors' invoices and issue any necessary subcontract modifications.

#### 1.13 Pathway Analysis Report (PAR)

The contractor shall prepare a Pathway Analysis Report in accordance with the "Risk Assessment Guidance for Superfund: Part D," dated December 2001. The PAR shall be submitted after the draft work plan is approved; the specific schedule for submission of the PAR will be established as part of final work plan approval. The PAR must be reviewed and approved by EPA prior to submission of the draft risk assessment report.

The PAR shall describe the risk characterization process and how the risk assessment will be prepared, in order to allow the risk assessors to ensure that the proper guidance and methodologies are followed. This report shall contain all of the information necessary for a reviewer to understand how the risks at the site will be addressed, including the statistical treatment of the data, the methods for selection of the contaminants of potential concern (COPCs), the exposure pathways, receptors and parameters to be used, and the current toxicological values. The report shall include the RAGS, Part D Tables 1 through 6, as well as explanatory text, based on all data collected. The PAR shall be completed after all data are collected, in accordance with the requirements of RAGS, Part D Tables 1 through 6. If the contractor recommends modeling, a description of the model and an explanation of the inputs and assumptions shall be included in the PAR so that their appropriateness can be determined (see also Subtask 6.3). The results shall be provided in the draft human health risk assessment under Subtask 7.1.

### **Task 2 Community Relations**

This task covers technical support to be provided by the contractor during public meetings and availability sessions conducted under this work assignment. The contractor shall provide community relations support to EPA throughout this RI/FS assignment in accordance with the "*Superfund Community Involvement Handbook*" (EPA 540-K-05-003, April 2005).

#### 2.1 Community Interviews

The contractor shall perform the following requirements under this subtask:

- Community Interviews Preparation. The contractor shall review relevant background documents as provided by the EPA WAM, and shall provide technical support as directed by the WAM in conducting community interviews. The WAM will conduct interviews with the appropriate governmental officials (federal, state, county, township, city), environmental groups, local broadcast and print media and any other relevant individuals or groups, either in person or via telephone.

- Community Interviews Questions. The contractor shall prepare draft interview questions for review by the EPA WAM. The contractor shall prepare final interview questions incorporating all EPA comments.

## 2.2 Community Relations Plan

The contractor shall prepare a draft CRP that presents an overview of the community's concerns and covers the following elements: 1) site background including location, description and history; 2) community overview including a community profile, concerns and involvement; 3) community involvement objectives and planned activities, with a proposed schedule for performance of these activities; 4) a mailing list of contacts and interested parties; 5) names and addresses of the information repositories and public meeting facility locations; 6) a list of acronyms; and 7) a glossary. The contractor shall submit the final CRP incorporating all EPA review comments.

## 2.3 Public Meeting Support

The contractor shall perform the following activities in support of public meetings, availability sessions, and open houses under this work assignment:

- The contractor shall make reservations for a meeting space, per the technical direction of the EPA WAM.
- The contractor shall attend public meetings and availability sessions, and prepare meeting summaries. For budgeting purposes, the contractor shall assume that four (4) public meetings will be held.
- The contractor shall reserve a court reporter for each public meeting as directed by the EPA WAM. The contractor shall provide a full-page original and a "four on one" page copy, along with an electronic version of the transcripts, with additional copies placed in the information repositories as required by the WAM.
- The contractor shall prepare and maintain a sign-in sheet for each public meeting. The contractor shall make use of the names provided on the sign-in updating the site mailing list (see Subtask 2.8).

## 2.4 Fact Sheet Preparation

The contractor shall prepare draft information letters/updates/fact sheets in accordance with the approved CRP for the site. For budgeting purposes, the contractor shall assume 4 fact sheets (1 fact sheet for each public meeting), 2 to 4 pages in length, with 3 illustrations per fact sheet. The contractor shall research, write, edit, design, layout, and photocopy the fact sheets. The contractor shall prepare the final fact sheets incorporating all EPA review comments. The contractor shall attach mailing labels to the final fact sheets before delivering them to EPA, who will be responsible for mailing the fact sheets.

## 2.5 Proposed Plan Support

The contractor shall provide administrative and technical support for the preparation of the draft and final Proposed Plan describing the preferred alternatives and other alternatives evaluated in the Feasibility Study. The Proposed Plan shall describe opportunities for public involvement in the Record of Decision, and shall be prepared in accordance with the NCP and the "*Superfund Community Involvement Handbook*" (EPA 540-K-05-003, April 2005). The technical support to be provided covers preparation of graphic materials and/or maps, as well as technical clarifications concerning the selected remedy and/or remedial alternatives, as identified in the Feasibility Study.

## 2.6 Public Notices

The contractor shall prepare newspaper announcements/public notices in the most widely read local newspaper(s), in support of each of the 4 public meetings. The contractor shall place each public advertisement in a large area-wide newspaper and a small local newspaper.

## 2.7 Information Repositories - Not Applicable

## 2.8 Site Mailing List

The contractor shall update the mailing list used for community relations activities at this site. For budgeting purposes, the contractor shall assume that the mailing list will be updated six times, and that the mailing list will contain about 1,000 entries. At the request of the EPA WAM, the contractor shall provide a copy of the mailing list on disk and mailing labels for each mailing. EPA will do the actual mailing of any information to the community.

## 2.9 Responsiveness Summary Support

The contractor shall provide administrative and technical support for the site Responsiveness Summary. As directed by the EPA WAM, the contractor shall prepare a draft Responsiveness Summary compiling and summarizing comments received during the public comment period on the Proposed Plan. The contractor shall also prepare technical reviews and draft responses for selected technical comments, for EPA's review and use in preparing the formal responses. For budgeting purposes, the contractor shall assume receipt of 300 separate comments (including duplicates) and preparation of 150 technical responses.

# **Task 3 Field Investigation**

Data acquisition entails collecting environmental samples and information required to support the RI/FS. The plans describing requirements for collection of the field data are discussed in Task 1. Data acquisition under this task begins with EPA's approval of the QAPP and ends with the demobilization of field personnel and equipment from the site. The contractor shall perform the following field activities for data acquisition in accordance with the EPA-approved QAPP prepared under Task 1.

## 3.1 Site Reconnaissance

The contractor shall conduct site surveys including property, boundary, utility rights-of-way, and topographic information.

- Existing well development and establishment of sampling points
- On-site well sampling
- Surface water sampling
- Soil sampling
- Sediment sampling
- Photographic documentation

## 3.2 Mobilization and Demobilization

The contractor shall provide the necessary personnel, equipment, and materials for mobilization and demobilization to and from the site.

Mobilization activities include:

- Site preparation
- Installation of utilities
- Lease of temporary facilities
- Establishment of health and safety zones
- Initial health and safety debriefing for all project team members

Demobilization activities include:

- Demobilization of field laboratory (if one was used)

- Decontamination and removal of equipment and temporary facilities
- Site restoration

### 3.3 Hydrogeological Assessment

The contractor shall perform the following activities under this subtask:

- i. Assessment of all existing monitoring wells and evaluation of their suitability, both conceptually and technically, for sampling required to characterize site contamination accurately and thoroughly for the RI.
- ii. Installation of additional monitoring wells as necessary to supplement existing monitoring wells for the performance of the RI.
- iii. Groundwater elevation measurements.
- iv. A surface water reconnaissance/evaluation to determine whether a surface water body could be potentially impacted by contaminated groundwater or site runoff.
- v. A groundwater and site runoff/surface water interaction evaluation, should the surface water reconnaissance/evaluation under Item iv indicate that a surface water body could be potentially impacted by either contaminated groundwater or site runoff.

### 3.4 Soil Boring, Drilling, and Testing

The contractor shall install monitoring wells and perform soil borings as directed by EPA. The contractor shall record formation cuttings, type, and sorting and drilling rates during the boring and drilling activities. The contractor shall also prepare and maintain geophysical logs (gamma, resistivity, caliper) of each boring.

### 3.5 Environmental Sampling

The contractor shall perform the following activities under this subtask:

- Field screening
- Groundwater sampling
- Surface soil sampling
- Soil boring/permeability sampling
- Surface water and sediment sampling (if necessary - see Subtask 3.3, Item v)

### 3.6 Ecological Characterization - *Not Applicable*

### 3.7 Geotechnical Survey - *Not Applicable*

### 3.8 Investigation-Derived Waste (IDW) Characterization and Disposal

The contractor shall characterize and dispose of investigation-derived wastes in accordance with local, State, and Federal regulations as specified in the QAPP (reference the *Guide to Management of Investigation-Derived Wastes*, 9345.3-03FS [January 1992]).

## **Task 4 Sample Analysis**

The contractor shall arrange for the analysis of environmental samples collected during Task 3. The contractor's work plan budget for this task shall include only the cost of the sample analysis. Costs for efforts associated with sample collection shall be included in Task 3, efforts associated with shipment and validation included in Task 5, and efforts

associated with data evaluation included in Task 6. In accordance with the approved work plan and QAPP for this work assignment, the contractor shall analyze the samples as outlined in the following subtasks:

#### 4.1 Innovative Methods/Field Screening Sample Analysis

The contractor shall perform the following types of sample analyses under this subtask:

- Analyze groundwater/surface water samples
- Analyze soil and sediment samples

#### 4.2 Analytical Services Provided Via CLP, DESA or EPA-ERT

The contractor shall identify the number and types of samples as called for below. Analysis of these samples will be performed by Region 2 DESA, CLP, or ERT.

- Analyze groundwater samples
- Analyze surface water samples
- Analyze soil and sediment samples

#### 4.3 Non-Routine Analytical Services - *Optional*

**Note:** *This subtask is an optional requirement. The contractor shall not include a cost estimate for performance of this subtask as part of its work plan budget. In the event that EPA determines that performance of this subtask is necessary, a WA amendment will be issued to formally implement these requirements into this work assignment.*

The contractor shall perform the following types of sample analysis under this subtask:

- Analyze groundwater samples
- Analyze surface water samples
- Analyze soil and sediment samples

### **Task 5 Analytical Support and Data Validation**

The contractor shall arrange for the validation of environmental samples analyzed under Task 4. Sample validation under this task begins with the completion of the field sampling program and reservation of sample slots in the CLP, and ends with the contractor's validation of the analytical data received from the laboratory. The contractor shall validate all analytical data, whether received from EPA laboratories, CLP laboratories, or subcontracted laboratories.

The contractor shall ensure that all subcontracted laboratory analyses are performed in accordance with generally-accepted EPA methods, and shall submit all analytical data from subcontracted laboratories to EPA in a CLP-deliverable format. The contractor shall perform the activities described in the following subtasks:

#### 5.1 Prepare and Ship Samples

The contractor shall prepare and ship the analytical samples collected under Task 3 in accordance with the approved QAPP.

#### 5.2 Sample Management

The contractor shall perform sample management, covering the following activities:

- Coordinate with the EPA Sample Management Office (SMO), the Region 2 Sample Control Coordinator (RSCC), the Division of Environmental Science and Assessment (DESA) and/or other applicable EPA sample management offices regarding analytical, data validation, and quality assurance issues.

- Implement EPA-approved laboratory quality assurance program to provide oversight of in-house and/or subcontract laboratories.
- Provide chain-of-custody, sample retention, and data storage functions in accordance with the approved contract-wide QAPP, QMP and contract requirements. The contractor shall ensure that accurate chain-of-custody procedures are implemented and carried out for sample tracking, protective sample packing is performed, and proper sample preservation techniques are used.

### 5.3 Data Validation

The contractor shall validate the data to ensure that the data and chain-of-custody are accurate and defensible. The contractor shall perform the following activities under this subtask:

- Review analysis results against validation criteria.
- Review the data and make a data usability determination.
- Provide a data validation report to the EPA WAM after all data have been validated.

## **Task 6 Data Evaluation**

The contractor shall organize and evaluate existing data and data gathered during the previous tasks that will be used later in the RI/FS effort. Data evaluation begins with the receipt of analytical data from Task 5, and ends with the submittal of the Data Evaluation Summary Report. The contractor shall perform the following activities under this task:

### 6.1 Data Usability Evaluation

The contractor shall evaluate the usability of the data, including any uncertainties associated with the data.

### 6.2 Data Reduction, Tabulation, and Evaluation

The contractor shall evaluate, interpret, and tabulate data in an appropriate presentation format for final data tables. The following shall be used as general guidelines in the preparation of data for the RI report:

- Tables of analytical results should be organized in a logical manner such as by sample location number, sampling zone, or some other logical format. Groundwater analytical results shall be separated into groups based on the hydrogeologic framework such as shallow aquifer up gradient, deep aquifer up gradient, shallow aquifer down gradient and deep aquifer down gradient. Well identification numbers within each set could be ordered according to whatever alpha-numeric system is used for the well identification numbers. Surface/subsurface soil analyses shall be separated according to site location or specific contaminant source and background areas. The contractor shall coordinate the table organization with the EPA WAM.
- Analytical results shall not be organized by laboratory identification numbers because these numbers do not correspond to those used on sample location maps. The sample location/well identification number shall always be used as the primary reference for the analytical results. The sample location number shall also be indicated if the laboratory sample identification number is used.
- Analytical tables should indicate the sample collection dates.
- The detection limit shall be indicated in instances where a parameter was not detected.
- Analytical results shall be reported in the text, tables and figures using a consistent convention such as ug/l for groundwater analyses and mg/kg for soil analyses.
- The lead agency's protocol for eliminating field sample analytical results based on laboratory/field blank

contamination results shall be clearly explained.

- Discussion of approved sampling results shall not be qualified by suggesting that a particular chemical is a common lab contaminant or was detected in the lab blank. If the reported result has passed QA/QC it shall be considered valid. In cases where the chemical in question was known to have been used and/or disposed of on site, positively identified at high levels in other environmental media, and passes QA/QC protocols, the sampling results shall not be questioned as being due to laboratory contaminants.
- Field equipment rinsate blank analyses results shall be discussed in detail if decontamination solvents are believed to have contaminated field samples.

### 6.3 Modeling - Optional

**Note:** *This subtask is an optional requirement. The contractor shall not include a cost estimate for performance of this subtask as part of its work plan budget. In the event that EPA determines that performance of this subtask is necessary, a WA amendment will be issued to formally implement these requirements into this work assignment.*

The contractor shall evaluate the existing data collected under the field investigation and make an assessment of the need for modeling to complete an accurate characterization of the nature, extent, distribution and movement of site contamination. **This evaluation will also cover the historical distribution and movement of site contamination (forensic modeling) to help identify potential source areas, utilizing the results of the chemical fingerprinting analysis.** The contractor shall provide a technical memorandum to the EPA WAM summarizing the results of this evaluation and its recommendations concerning performance of modeling for this RI/FS. Based on its review of this technical memorandum, EPA will determine whether modeling will be conducted for this RI/FS, and will direct the contractor to perform a modeling effort if required.

### 6.4 Data Evaluation Summary Report

The contractor shall evaluate and present results in a Data Evaluation Summary Report and submit to the EPA WAM for review and approval. The report shall include an evaluation of the historical data, identify gaps that may be addressed as part of the RI, include a summary of data gathered as part of the field investigation, and identify data gaps for future investigations. If additional analytical data are needed or if significant data problems are identified during the evaluation, the contractor shall provide a separate memorandum describing these problems for review by the WAM.

## **Task 7 Assessment of Risk**

The risk assessment will determine whether site contaminants pose a current of potential risk to human health and the environment in the absence of any remedial action, and will be used to determine whether remediation is necessary at the site, provide justification for performing remedial action, and determine what exposure pathways need to be remediated. The contractor shall perform the risk assessment, addressing the contaminant identification, exposure assessment, toxicity assessment, and risk characterization, in accordance with the requirements of the following subtasks.

### 7.1 Baseline Risk Assessment (Human Health)

The contractor shall perform the Baseline Human Health Risk Assessment (HHRA) in accordance with the approach and parameters described in the approved Pathway Analysis Report (PAR). The requirements for the PAR are described in Subtask 1.13 above. The PAR must be reviewed by EPA prior to the submission of the draft risk assessment report. The contractor shall incorporate EPA review comments on the PAR into the draft HHRA.

**Draft Baseline Human Health Risk Assessment Report:** The contractor shall prepare a draft Baseline Human Health Risk Assessment report covering the following requirements:

- Hazard Identification. The contractor shall identify and describe the contaminants of potential concern (COPCs) based on their intrinsic toxicological properties.
- Characterization of Site and Potential Exposure Pathways. The contractor shall identify and characterize human populations in the exposure pathways.
- Exposure Assessment. The exposure assessment shall identify the magnitude of actual or potential human exposures, the frequency and duration of these exposures, and the routes by which receptors are exposed. The exposure assessment shall include an evaluation of the likelihood of such exposures occurring and shall provide the basis for the development of acceptable exposure levels. In preparing the exposure assessment, the contractor shall develop reasonable maximum estimates and central tendency (when appropriate) of exposure for both current and potential land use conditions at the site. The rationale for use of site-specific over default exposure factors should be clearly explained and justified.
- Toxicity Assessment. The contractor shall list all toxicity values (e.g., slope factors and reference doses) for the COPCs and the sources of the toxicity values, in accordance with EPA's current toxicity hierarchy ((see "Human Health Toxicity Values in Superfund Risk Assessments," OSWER Directive 9285.7-53, December 5, 2003). The contractor shall submit chemicals without assigned toxicity values in Tiers 1 and 2 to EPA for determination of the appropriate value.
- Risk Characterization. During risk characterization, chemical-specific toxicity information, combined with quantitative and qualitative information from the exposure assessment, shall be compared to measured levels of contaminant exposure and the levels predicted through environmental fate and transport modeling. These comparisons shall determine whether concentrations of contaminants at or near the site are affecting or could potentially affect human health. Based on these results, the contractor shall also address other aspects important to the risk characterization, such as a qualitative discussion of chemicals without toxicity data and how concentrations found on site relate to background concentrations.
- Identification of Limitations/Uncertainties. The contractor shall identify critical assumptions and uncertainties (e.g., background concentrations, modeling inputs, toxicity data, environmental data, et al.) in the report.
- Site Conceptual Model. The contractor shall develop a conceptual model of the site based on the contaminant identification, exposure assessment, toxicity assessment, and risk characterization.

*Final Baseline Human Health Risk Assessment Report:* The contractor shall submit the final Baseline Human Health Risk Assessment Report incorporating all EPA review comments.

## 7.2 Baseline Risk Assessment - Ecological Risk Assessment

The contractor shall perform a Screening-Level Ecological Risk Assessment (SLERA) in accordance with current Superfund ecological risk assessment guidance (*Ecological Risk Assessment Guidance for Superfund, Process for Designing and Conducting Ecological Risk Assessments [ERAGS], EPA/540-R-97-006, June 1997*). The contractor shall compare the maximum contaminant concentrations in each medium of concern to appropriate conservative ecotoxicity screening values, and should use conservative exposure estimates. EPA will review and approve the SLERA and determine whether a full Baseline Ecological Assessment is required.

At EPA's direction, the contractor shall perform a Baseline Ecological Risk Assessment in accordance with EPA 540-R-97-006, ERAGS, dated June 1997. The contractor shall evaluate and assess the risk to the environment posed by site contaminants. As part of this effort, the contractor shall perform the following activities:

*Draft Ecological Risk Assessment Report.* The contractor shall prepare a draft Ecological Risk Assessment Report that addresses the following:

- **Hazard Identification (sources).** The contractor shall review available information on the hazardous substances present at the site and identify the major contaminants of concern.
- **Dose-Response Assessment.** Contaminants of concern will be selected based on their intrinsic toxicological properties.
- **Characterization of Site and Potential Receptors.** The contractor shall identify and characterize environmental exposure pathways.
- **Select Chemicals, Indicator Species, and End Points.** In preparing the assessment, the contractor shall select representative chemicals, indicator species (species that are especially sensitive to environmental contaminants), and end points on which to concentrate.
- **Exposure Assessment.** The exposure assessment will identify the magnitude of actual or environmental exposures, the frequency and duration of these exposures, and the routes by which receptors are exposed. The exposure assessment shall include an evaluation of the likelihood of such exposures occurring and shall provide the basis for the development of acceptable exposure levels. In developing the exposure assessment, the contractor shall develop reasonable maximum estimates of exposure for both current land use conditions and potential land use conditions at the site.
- **Toxicity Assessment/Ecological Effects Assessment.** The toxicity and ecological effects assessment will address the types of adverse environmental effects associated with chemical exposures, the relationships between magnitude of exposures and adverse effects, and the related uncertainties for contaminant toxicity (e.g., weight of evidence for a chemical's carcinogenicity).
- **Risk Characterization.** As part of the risk characterization, the contractor shall compare chemical-specific toxicity information, combined with quantitative and qualitative information from the exposure assessment, to measured levels of contaminant exposure levels and the levels predicted through environmental fate and transport modeling. These comparisons shall determine whether concentrations of contaminants at or near the site are affecting or could potentially affect the environment.
- **Identification of Limitations/Uncertainties.** The contractor shall identify critical assumptions (e.g., background concentrations and conditions) and uncertainties in the report.
- **Site Conceptual Model.** The contractor shall develop a conceptual model of the site based on the contaminant identification, exposure assessment, toxicity assessment, and risk characterization.

*Final Ecological Risk Assessment Report:* The contractor shall submit the final Ecological Risk Assessment report incorporating all EPA review comments.

## **Task 8 Treatability Study and Pilot Testing**

Remedial technologies that may be suitable to the site should be identified as early as possible to determine whether there is a need to conduct treatability studies to better estimate costs and performance capabilities. The treatability study will determine the suitability of remedial technologies to site conditions and problems. The three levels of treatability studies are laboratory screening, bench-scale testing, and pilot-scale testing. The laboratory screening is used to establish the validity of a technology to treat waste and is normally conducted during the Feasibility Study. Bench-scale testing is used to identify the performance of the technology specific to a type of waste for an operable unit; bench-scale tests are often conducted during the FS. Pilot-scale testing is used to provide quantitative performance, cost, and design information for remediation, and is typically performed during the RI/FS (see the “*Guide for Conducting Treatability*

*Studies under CERCLA,*” October 1992).

#### 8.1 Literature Search

The contractor shall research viable technologies that may be applicable to the contaminants of concern and the site conditions encountered. The contractor shall provide a technical memorandum to the EPA WAM summarizing the results of this literature search and assessing the need for additional treatability studies. As part of this document, the contractor shall submit a plan recommending performance of a treatability study at one of the above levels and identifying the types and specific goals of the study. The treatability study shall determine the suitability of remedial technologies to site conditions and problems. Based on its review of this technical memorandum, EPA will determine whether a bench test or pilot study will be conducted for this project, and will direct the contractor to prepare an addendum to the RI/FS work plan describing its detailed approach for performance of the treatability study, in accordance with the requirements described in Subtask 8.2 below.

*Note: Subtasks 8.2 through 8.4 are optional requirements. In the event that EPA determines that performance of these subtasks are necessary, a WA amendment will be issued to formally implement these requirements into this work assignment.*

#### 8.2 Treatability Study Work Plan Addendum (Optional)

Upon implementation of this requirement, the contractor shall prepare a draft addendum to the RI/FS work plan describing its approach for performance of the treatability study, participate in negotiations to discuss the final technical approach and costs required to accomplish the treatability study requirements, and prepare a final work plan addendum and supplemental budget incorporating the agreements reached during the negotiations.

The treatability study work plan addendum shall describe the technology to be tested, test objectives, test equipment or systems, experimental procedures, treatability conditions to be tested, measurements of performance, analytical methods, data management and analysis, health and safety procedures, and residual waste management. The DQOs for the treatability study shall also be documented. If pilot-scale treatability studies are to be done, the treatability study work plan shall also describe pilot plant installation and startup, pilot plant operation and maintenance procedures, and operating conditions to be tested. If testing is to be performed off-site, permitting requirements shall be addressed. A schedule for performing the treatability study shall be included with specific dates for each task and subtask, including EPA review periods. Key milestones that should have completion dates specified included, but are not limited to, the procurement of contractors and the completion of sample collection, the performance period, sample analysis, and report preparation.

The treatability study work plan shall describe in detail the treatment process and how the proposed vendor or technology will meet the performance standards for the site. The treatability study work plan shall address how the contractor will meet all discharge or disposal requirements for any and all treated material, air, water, and expected effluents. In addition, the work plan addendum shall explain the proposed final treatment and disposal of all material generated by the proposed treatment system.

#### 8.3 Conduct Treatability Studies (Optional)

The contractor shall conduct the treatability study in accordance with the approved treatability study addendum to the RI/FS work plan, QAPP, and HASP, to determine whether the remediation technology (or vendor of the technology) can achieve the required performance standards.

The following activities are required as part of the performance of the treatability study and pilot testing:

- Procure Test Facility and Equipment. The contractor shall procure the subcontractors, test facility and equipment necessary to perform the tests.
- Test and Operate Equipment. The contractor shall test the equipment to ensure proper operation, and operate or

oversee operation of the equipment during the testing.

- Retrieve Sample for Testing. The contractor shall collect samples for testing as specified in the treatability study work plan.
- Perform Laboratory Analysis. The contractor shall establish a field laboratory to facilitate fast turnaround analysis of test samples, or, if necessary, shall procure outside laboratory services to analyze the test samples and evaluate test results.
- Characterize and dispose of residual wastes.

#### 8.4 Treatability Study Evaluation Report (Optional)

The contractor shall prepare and submit the treatability study evaluation report that describes the performance of the technology. The study results shall clearly indicate the performance of the technology or vendor compared with the performance standards established for the site. The report shall also evaluate the treatment technology's effectiveness, implementability, cost, and final results compared with the predicted results. The report shall also evaluate full-scale application of the technology, including a sensitivity analysis identifying the key parameters affecting full-scale operation.

### **Task 9 Remedial Investigation Report**

The contractor shall develop and deliver a Remedial Investigation (RI) report that accurately establishes the site characteristics such as the contaminated media, extent of and movement of contamination, the physical boundaries of the contamination, and the potential sources of contamination. Pursuant to this objective, the contractor shall obtain only the minimum essential amount of detailed data necessary to determine these parameters for the key contaminants. The contractor must select the key contaminants based on their persistence and mobility in the environment and their degree of hazard. The contractor shall evaluate the key contaminants identified for receptor exposure and prepare an estimate of the key contaminant(s) level reaching human or environmental receptors. The contractor shall use existing standards and guidelines such as drinking-water standards, water quality criteria, and other criteria accepted by EPA as appropriate for the situation to evaluate effects on human receptors that may be exposed to the key contaminants above appropriate standards or guidelines. The RI must be consistent with the baseline human health risk assessment.

The contractor shall prepare the RI report in accordance with the *"Guidance for Conducting Remedial Investigations/Feasibility Studies under CERCLA,"* OSWER Directive 9355.3-01, October 1988, and *"Guidance for Data Usability in Risk Assessment, Parts A and B"* (EPA 9285.7-09A, April 1992 and 9285.7-09B, May 1992). The EPA WAM shall specify the format for the report if Region 2-specific requirements or other special requirements are called for.

#### 9.1 Draft Remedial Investigation Report

The contractor shall prepare a draft Remedial Investigation report in accordance with the above the guidance as well as the schedule in the final approved RI/FS work plan. An outline of the structure for the RI report and the subject areas and material to be covered is as follows:

- 1) Executive Summary
- 2) Introduction
  - a) Purpose of the report
  - b) Site background
    - i) Site description
    - ii) Site history
    - iii) Previous investigations

- iv) Previous emergency or interim actions
- v) Report organization

### 3) Study Area Investigation

- a) Covers field activities associated with site characterization, including as appropriate physical and chemical monitoring of the following:
  - i) Surface features (e.g., topographic mapping, natural and manmade features)
  - ii) Contaminant source investigations
  - iii) Meteorological investigations
  - iv) Surface water and sediment investigations
  - v) Geological investigations
  - vi) Soil and vadose zone investigations
  - vii) Groundwater investigations
  - viii) Human populations surveys
  - ix) Ecological investigations
  - x) Vapor intrusion sampling (indoor air and subslab soil gas)
- b) Technical memoranda documenting field activities should be summarized in this chapter and included as an appendix to the RI report.

### 4) Physical characteristics of the study area

- a) Covers the results of field activities to determine physical characteristics, including the following, as appropriate:
  - i) Surface features
  - ii) Meteorology
  - iii) Surface water hydrology
  - iv) Geology
  - v) Soils
  - vi) Hydrogeology
  - vii) Demography and land use
  - viii) Ecology

### 5) Nature and Extent of Contamination *(Note: The values used to determine nature and extent shall be approved by EPA prior to submittal of the draft Remedial Investigation report.)*

- a) Presents the results of site characterization, both natural and chemical components and contaminants, as appropriate, in the following media:
  - i) Sources (lagoons, sludges, tanks)
  - ii) Soils and vadose zone
  - iii) Groundwater
  - iv) Surface water and sediments
  - v) Air
  - vi) Subsurface gases

### 6) Contaminant Fate and Transport

- a) Potential routes of migration (e.g.; air, groundwater, soils)
- b) Contaminant persistence: Describe estimated persistence in the study area environment and physical, chemical, and/or biological factors of importance for the media of interest, as applicable;
- c) Contaminant Migration:
  - i) Discuss factors affecting contaminant migration for the media of interest (e.g., sorption onto soils, solubility in water, movement of groundwater, etc.)
  - ii) Discuss modeling methods and results if applicable

## 7) Baseline Risk Assessment

- a) Human health risk assessment
  - i) Hazard identification
  - ii) Exposure assessment
  - iii) Toxicity assessment
  - iv) Risk characterization/uncertainty discussion
- b) Environmental Evaluation

## 8) Summary

- a) Summary
  - i) Nature and extent of contamination
  - ii) Fate and transport
  - iii) Risk assessment

## 9) Conclusions

- a) Data limitations and recommendations for future work
- b) Recommended remedial action objectives

## 10) References

## 11) Tables and Figures

12) Appendices (including log books, soil boring logs, test pit/trenching logs, monitoring well construction diagrams, private and public well records, analytical data and QA/QC evaluation results)

### 9.2 Final Remedial Investigation Report

The contractor shall submit the final groundwater Remedial Investigation report incorporating all EPA review comments.

## **Task 10 Remedial Alternatives Screening**

This task covers the development of appropriate remedial alternatives that will undergo full evaluation. The alternatives are to encompass a range, including innovative treatment technologies, consistent with the regulations outlined in the National Contingency Plan (NCP), 40 CFR Part 300, the "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA" (OSWER Directive 9355.3-01, October 1998), and other applicable OSWER directives, policies and guidance, as referenced in [www.epa.gov](http://www.epa.gov) including 9355.4-03, October 18, 1989, and 9283.1-06, May 27, 1992, "Considerations in Ground Water Remediation at Superfund Sites") or more recent directives, policies, procedures, and guidance, as referenced in [www.epa.gov/superfund/policy/remedy/sfremedy/remedies.htm](http://www.epa.gov/superfund/policy/remedy/sfremedy/remedies.htm).

The contractor shall investigate only those hazardous waste management alternatives that will remediate or control contaminated media (soil, surface water, groundwater, sediments) remaining at the site, as determined necessary in the RI to provide adequate protection of human health and the environment. The potential alternatives shall encompass a range of alternatives in which treatment is used to reduce the toxicity, mobility, or volume of wastes but vary in the degree to which long-term management of residuals or untreated waste is required, and shall include one or more alternatives involving containment with little or no treatment as well as a no-action alternative.

### 10.1 Technical Memorandum

The contractor shall prepare a draft technical memorandum presenting the potential alternatives and including the following information:

- Establish Remedial Action Objectives. Based on existing information, the contractor shall identify site-specific remedial action objectives that should be developed to protect human health and the environment. The objectives shall specify the contaminants and media of concern, the exposure routes and receptors, and an acceptable contaminant level or range of levels for each exposure route (i.e., preliminary remediation goals).
- Establish General Response Actions. The contractor shall develop general response actions for each medium of interest by defining contaminant treatment, excavation, pumping, or other actions, singly or in combination, to satisfy remedial action objectives. The response actions shall take into account requirements for protectiveness as identified in the remedial action objectives as well as the chemical and physical characteristics of the site.
- Identify & Screen Applicable Remedial Technologies. The contractor shall identify and screen technologies based on the developed general response actions. The contractor shall identify and screen hazardous waste treatment technologies in order to ensure that only those technologies applicable to the contaminants present, their physical matrix, and other site characteristics will be considered. This screening will be based primarily on a technology's ability to effectively address the contaminants at the site, but will also take into account a technology's implementability and cost. The contractor shall select representative process options, as appropriate, to carry forward into alternative development. The contractor shall identify the need for treatability testing for those technologies that are probable candidates for consideration during the detailed analysis.
- Develop Remedial Alternatives in accordance with NCP.
- Screen Remedial Alternatives for Effectiveness, Implementability, and Cost. The contractor shall screen alternatives to identify the potential technologies or process options that will be combined into media-specific or site-wide alternatives. The contractor shall define the developed alternatives with respect to the size and configuration of the representative process options; time for remediation; rates of flow or treatment; spatial requirements; distances for disposal; and required permits, imposed limitations, and other factors necessary to evaluate the alternatives. If many distinct, viable options are available and developed, the contractor shall screen the alternatives that will undergo the detailed analysis in order to provide the most promising process options. The contractor shall screen these alternatives on a general basis with respect to their effectiveness, implementability, and cost.

## 10.2 Final Technical Memorandum

The contractor shall incorporate EPA's review comments on the draft technical memorandum into the draft Feasibility Study report prepared under Subtask 12.1. The contractor shall not submit a separate final technical memorandum for the sections of the FS report covered in Task 10.

## **Task 11 Remedial Alternatives Evaluation**

This task covers efforts associated with the assessment of individual alternatives against each of the nine current evaluation criteria and a comparative analysis of all options against the evaluation criteria. The analysis shall be consistent with the National Contingency Plan (NCP), 40 CFR Part 300 and shall consider the "Guidance for Conducting Remedial Investigation and Feasibility Studies under CERCLA" (OSWER Directive 9355.3-01, October 1988) and other pertinent OSWER guidance. EPA will make the determination regarding final selection of the remedial alternative.

The nine criteria the contractor shall employ in the evaluation of remedial alternatives are:

- Overall protection of human health and the environment

- Compliance with ARARs
- Long-term effectiveness and permanence
- Reduction in toxicity, mobility or volume through treatment
- Short-term effectiveness
- Implementability - technical and administrative
- Cost
- State acceptance
- Community acceptance

#### 11.1 Technical Memorandum

The contractor shall prepare a technical memorandum that addresses the following: (1) a technical description of each alternative that outlines the waste management strategy involved and identifies the key ARARs associated with each alternative; and (2) a discussion that profiles the performance of that alternative with respect to each of the evaluation criteria. The contractor shall provide a table summarizing the results of this analysis. After presentation of the complete analysis of each individual alternative, the contractor shall compare and contrast the alternatives to one another with respect to each of the evaluation criteria.

#### 11.2 Final Technical Memorandum

The contractor shall incorporate EPA's review comments on the draft technical memorandum into the draft Feasibility Study report prepared under Subtask 12.1. The contractor shall not submit a separate final technical memorandum for the sections of the FS report covered in Task 11.

### **Task 12 Feasibility Study Report**

The Contractor shall prepare a Feasibility (FS) report consisting of a detailed analysis of alternatives and a cost-effectiveness analysis in accordance with the National Contingency Plan (NCP), 40 CFR Part 300, and current EPA feasibility study guidance.

#### 12.1 Draft Feasibility Study Report

The contractor shall submit a draft Feasibility Study report in accordance with the performance schedule in the approved RI/FS work plan. To expedite the completion of the report, the contractor shall provide draft chapters of the report to the EPA WAM as they are completed. The FS report shall contain the following:

- Feasibility Study objectives
- Remedial objectives
- General response actions
- Identification and screening of remedial technologies
- Description of remedial alternatives
- Detailed analysis of remedial alternatives
- Summary and Conclusions

The contractor's technical feasibility considerations shall address in detail any problems that may prevent a remedial alternative from mitigating site problems. Accordingly, the contractor must present the technical feasibility of each remedial alternative considering the site characteristics from the RI. The contractor shall also address the reliability, safety, and operation and maintenance of each alternative, the ease with which the alternative can be implemented, and the time needed for implementation.

#### 12.2 Final FS Report

After EPA's review of the draft Feasibility Study report (which will incorporate the EPA review comments on the technical memoranda prepared under Subtasks 10.1 and 11.1 above), the contractor shall submit the final FS report

incorporating all EPA review comments.

### **Task 13 Post RI/FS Support**

The contractor shall provide technical support required for preparation of the Record of Decision for the site, excluding the community relations activities addressed under Task 2 of this SOW. The contractor's support shall include the following activities:

- Attendance at public meetings, briefings & technical meetings to provide site updates.
- Review of presentation materials.
- Technical support for presentation of draft and final Responsiveness Summary, Proposed Plan, and Record of Decision.
- Preparation and review of draft and a final Feasibility Study addendum (if required), based on the final ROD adopted for this site, and covering issues arising after finalization of the basic RI/FS documents.

### **Task 14 Work Assignment Closeout**

Upon notification from EPA, that the technical work under the work assignment is complete, the contractor shall perform the necessary activities to close out this work assignment in accordance with contract requirements.

#### **14.1 Document Indexing**

The contractor shall organize the work assignment files in its possession in accordance with the current approved EPA file index structure [e.g., Administrative Record Index, EPA Superfund Site File Index, and/or ARCS Guidelines for Closeout of Work Assignments (June 1991)]. For the Superfund program, Section 113(k) (1) of CERCLA, as amended by SARA, requires EPA to establish an Administrative Record (AR) that contains all of the information considered by the Agency in selecting a response action. The AR for the selection of a remedial action or response decision must be made available for public inspection at the commencement of the remedial investigation phase (i.e., when the RI/FS work plan is approved). The format to be used in compiling ARs is outlined in a memorandum from Don R. Clay, former Assistant Administrator, OSWER, entitled "*Final Guidance on Administrative Records for Selecting CERCLA Response Actions*," dated December 3, 1990.

#### **14.2 Document Retention/Conversion**

At the completion of the assignment, the contractor shall submit one copy of the site files and major deliverables in electronic format (Word, Excel, and PDF, as appropriate) to the EPA Records Manager.

<b>Attachment 1 Summary of Major Submittals for Remedial Investigation/Feasibility Study Matteo &amp; Sons, Inc. Site</b>			
<b>TASK</b>	<b>DELIVERABLE</b>	<b>Number of Copies</b>	<b>DUE DATE (calendar days)</b>
1.2	Scoping Meeting Minutes	3	5 days after scoping meeting
1.4	Updated RI/FS Work Plan and Draft Budget	4	45 days after scoping meeting
1.5	Final RI/FS Work Plan and Budget	4	15 days after conclusion of negotiations
1.7	Draft Quality Assurance Project Plan (QAPP)	3	15 days after receipt of EPA review comments on draft RI/FS work plan
1.7	Final Quality Assurance Project Plan (QAPP)	3	15 days after receipt of EPA review comments on draft QAPP

**Attachment 1**  
**Summary of Major Submittals for Remedial Investigation/Feasibility Study**  
**Matteo & Sons, Inc. Site**

TASK	DELIVERABLE	Number of Copies	DUE DATE (calendar days)
1.8	Draft Health and Safety Plan (HASP)	3	15 days after receipt of EPA comments on draft RI/FS work plan; to be submitted with draft QAPP
1.8	Final Health and Safety Plan (HASP)	3	15 days after receipt of EPA review comments on draft HASP; to be submitted with final QAPP
1.10	Meeting Minutes	3	5 days after each meeting
1.13	Pathways Analysis Report	2	TBD as finalized in approved work plan performance schedule
2.1	Community Interview Questions	3	TBD as finalized in approved work plan performance schedule
2.2	Draft Community Relations Plan	3	TBD as finalized in approved work plan performance schedule
2.2	Final Community Relations Plan	3	14 days after final comments from EPA on draft CRP
2.3	Public Meeting Transcripts	2	14 days after each public meeting
2.4	Fact Sheets	2	10 days prior to each public meeting
2.6	Public Notices	2	7 days prior to each public meeting
2.8	Site Mailing List	3	14 days after approval of final CRP; updates 7 days after each public meeting
2.9	Responsiveness Summary Support	3	21 days after public meeting
5.3	Data Validation Report	3	21 days after validation of all analytical data
6.4	Data Evaluation Report	5	TBD as finalized in approved work plan performance schedule
7.1	Draft Baseline Human Health Risk Assessment Report	3	30 days after approval of Pathway Analysis Report
7.1	Final Baseline Human Health Risk Assessment Report	3	14 days after receipt of EPA review comments on draft HHRA
7.2	Screening-Level Ecological Risk Assessment Report	3	45 days after completion of field investigation
7.2	Draft Baseline Ecological Risk Assessment Report	TBD	TBD upon implementation into this work assignment
7.2	Final Baseline Ecological Risk Assessment Report	TBD	TBD upon implementation into this work assignment
8.1	Results of Treatability Literature Search	2	TBD and as finalized in approved work plan performance schedule
8.2	Draft Treatability Study Work Plan Addendum	3	TBD upon implementation into this work assignment

**Attachment 1**  
**Summary of Major Submittals for Remedial Investigation/Feasibility Study**  
**Matteo & Sons, Inc. Site**

TASK	DELIVERABLE	Number of Copies	DUE DATE (calendar days)
8.2	Final Treatability Study Work Plan Addendum	3	TBD upon implementation into this work assignment
8.4	Treatability Study Report	3	TBD upon implementation into this work assignment
9.1	Draft Remedial Investigation (RI) Report	6	90 days after completion of field investigation
9.2	Final Remedial Investigation (RI) Report	6	30 days after receipt of EPA review comments
10.1	Draft Remedial Alternatives Technical Memorandum	6	TBD as finalized in approved work plan performance schedule
11.1	Draft Remedial Alternatives Evaluation Memorandum	6	TBD as finalized in approved work plan performance schedule
12.1	Draft Feasibility Study Report	6	45 days after submission of Remedial Alternatives Evaluation Memorandum
12.2	Final Feasibility Study Report	6	30 days after receipt of EPA review comments
14.2	Document Retention/Conversion	3	Within 60 days after EPA notification of WA completion

## ATTACHMENT 2 “GREEN REMEDIATION” PRACTICES

This attachment describes EPA Region 2’s current basic guidelines for the contractor’s evaluation and implementation of “Green Remediation” practices in the performance of remedial activities under work assignments issued for this contract. In the performance of these remedial activities, the contractor shall, to the extent practicable, explore and evaluate the use of:

**Clean Air**, through the use of cleaner technology and engines, cleaner fuel and cleaner diesel control technology on all diesel equipment used at sites during the remedial work. Clean diesel technologies are preferred, and alternative fuels such as biodiesel or natural gas-powered vehicles should also be considered. The contractor shall use alternative fuels, of at least a B20 blend or higher, on all on-site diesel equipment where these fuels are available within a reasonable distance from the site. The contractor shall employ the most efficient emission control technology for reducing particulate matter (PM) emissions on non-road and on-road diesel powered equipment used at a site. The contractor shall use cleaner engines, which include non-road engines meeting Tier II or cleaner standards and on-road engines meeting 2004 “On-Highway Heavy Duty Engine Emissions Standards” or cleaner.

**Renewable Energy Sources**, when conducting work related to selection of a cleanup remedy, constructing a cleanup remedy, and upgrading or otherwise improving an existing cleanup remedy. These sources of renewable energy can include solar, wind, and biofuels. Examples of renewable energy technologies include photovoltaic panels, wind turbines, digesters, gasifiers, and microturbines. As part of evaluating renewable energy sources and technologies, the contractor shall perform cost analyses that compare the energy costs from renewable sources to costs from traditional electricity sources provided by local utilities, over the expected life of the cleanup remedy. The contractor shall also perform evaluations of the emissions prevented as a result of using renewable energy sources versus traditional energy sources provided by local utilities. Finally, the contractor shall evaluate the costs of purchasing “green power” from organizations that offer such green power within the state where the site is located.

**“GreenScapes,”** as a cost-efficient and environmentally friendly solution for site landscaping. The “Greenscapes” concept has been designed to help preserve natural resources and prevent waste and pollution, and encourages practitioners to make more comprehensive decisions regarding waste generation and disposal and their associated cost and environmental effects on land, water, air, and energy use. “GreenScaping” encompasses a set of landscaping practices that can improve the health and appearance of the landscape at a site while protecting and preserving natural resources by reducing or eliminating the amount of waste materials involved in groundskeeping and the amount of water, pesticides, fuels, oils, and other materials used in landscaping. The practices involved in “GreenScaping” to reduce landscaping costs include: 1) **Reducing** the production of waste to promote more efficient use of materials; 2) **Reusing** materials in order to prolong their useful life and delay their recycling and/or final disposal; 3) **Recycling** to minimize waste generation by recovering and reprocessing usable products that might otherwise be disposed of ; and 4) **“Rebuying”** by making purchases that meet project needs but have a better overall effect on the environment, such as biobased, recycled content, and other environmentally preferable elements. (For more information on “GreenScapes,” see [www.epa.gov/osw/partnerships/greenscapes/index.htm](http://www.epa.gov/osw/partnerships/greenscapes/index.htm).)

**Industrial Materials Reuse (IMR)**, involving reusing or recycling byproduct materials generated from industrial processes that can be used as substitutions for raw materials in the manufacture of consumer products, roads, bridges, buildings, and other construction projects. For example, nonhazardous industrial materials, such as coal ash, foundry sand, construction and demolition materials, slag, and gypsum, are valuable products of industrial processes that can be recycled in a variety of diverse applications. These materials have many of the same chemical and physical properties as the virgin materials they replace, and in many cases can even improve the quality of a product. Putting these commodities into productive use can save resources and energy and reduce greenhouse gas emissions. As such, the reuse and recycling of industrial materials is preferred when applicable, and may even present opportunities for revenue generation to offset remedial costs. (For more information on Industrial Materials Reuse, see [www.epa.gov/osw/conservation/rrr/imr/index.htm](http://www.epa.gov/osw/conservation/rrr/imr/index.htm).)

### **Attachment 3**

#### **EPA Region 2 Green Site Assessment and Remediation Checklist**

In accordance with EPA's strategic plan for compliance and environmental stewardship, the Agency strives for cleanup programs that use natural resources and energy efficiently, reduce negative impacts on the environment, minimize or eliminate pollution at its source, and reduce waste to the greatest extent possible. The EPA Region 2 Superfund Program supports the adoption of "green site assessment and remediation," which can be defined as the practice of considering all environmental effects of remedy selection and implementation, and incorporating strategies to maximize the net environmental benefit of cleanup actions.<sup>1</sup> This definition encompasses each phase of a project, from investigation through remediation and restoration. Opportunities to green a project exist through consideration of the following key variables.<sup>2</sup>

- \_ Water Use
- \_ Land Use
- \_ Energy Use
- \_ Air Emissions, Including Greenhouse Gas Emissions
- \_ Land Use/Ecosystem Impact
- \_ Materials Use and Waste Produced
- \_ Long-term Maintenance

An optimal phase in which to start considering these actions is during the Remedial Investigation/ Feasibility Study (RI/FS) phase of a cleanup. Best practices of green remediation can be incorporated throughout the RI/FS phase, and, to maximize sustainability, cleanup and reuse options should be considered early during the planning process, enabling best practices to carry forward to cleanup activities, redevelopment activities, and ultimate land reuse. Incorporation of green remediation strategies into cleanup procurement documents and site management plans helps to open the door for best practices in the field. In accordance with federal procurement policy, selection of cleanup equipment and services must meet a project's performance and cost requirements, while giving preference to green products and providers.<sup>3, 4</sup>

Best practices of green remediation help ensure that day-to-day operations during all cleanup phases maximize opportunities to preserve and conserve natural resources, while achieving the cleanup's mission of protecting human health and the environment. Each site should incorporate practices addressing core elements of green remediation, with periodic review and update as new opportunities arise. An adaptive approach to managing all phases of a site cleanup enables the site to transition directly into long-term stewardship status. Each site should outline site-specific procedures to, among other things:

- \_ Reduce air emissions (including greenhouse gas emissions) and energy use,
- \_ Demonstrate water-quality preservation and resource conservation,
- \_ Establish near-term improvements to the ecosystem that carry forward into site revitalization, and
- \_ Reduce material consumption and waste generation.

This checklist is designed to assist EPA contractors in planning for and implementing green practices during the RI/FS.

***EPA Region 2  
Green Site Assessment and Remediation Checklist  
Superfund Remedial Investigation/Feasibility Study Activities***

**ADMINISTRATIVE**

**\_ Incorporate green remediation practices into the contracting process, as possible**

Require contractors follow Region 2's Clean and Green Policy  
Suggest contractors consider green remediation best practices during RI/FS

**\_ Consider future use at beginning of project to guide investigation and remedy selection**

Future use may guide type of sampling required; ensure that it is most efficient and green method  
Encourage development of renewable energy production facilities on contaminated lands

**\_ Reporting and Communication**

**GENERAL ON-SITE OPERATIONS**

**\_ Encourage sustainable practices in trailers/buildings**

Utilize existing building for field office if possible  
Situate trailer to benefit from existing vegetation  
Utilize "green" trailers if possible **6, 7**  
Maintain heating and cooling systems  
Enhance indoor environmental quality **8**  
Optimize operational and maintenance practices to increase efficiency **9**

**\_ Minimize non-renewable energy consumption  
**10, 11, 12, 13, 14****

Purchase renewable energy supply through local utility programs  
Purchase Renewable Energy Credits/Certificates (RECs or Green Tags)  
Research potential for Green Pricing Programs and Power Purchase agreements

**\_ Use environmentally preferable products**

Compact Fluorescent Lights (CFL)  
Environmentally friendly electronics (e.g., ENERGY STAR) **15**  
Require the use of innovative approaches during the RI  
Interim and final documents should be submitted in digital rather than hardcopy format, unless otherwise requested by EPA, in an effort to save paper. This is especially applicable to voluminous data reports, such as the validation metadata for laboratory analyses.  
Utilize renewable Onsite Generation Systems, e.g., solar photovoltaic (PV), wind turbines, and biomass combustion.  
Require contractors to follow guidelines found in the NEDC Model Contract Specification.  
Diesel Emission Controls in Construction Projects **5**  
Recycled products  
Avoid use of pesticides where feasible and follow EPA's Integrated Pest Management Practices **16**

***EPA Region 2  
Green Site Assessment and Remediation Checklist  
Superfund Remedial Investigation/Feasibility Study Activities***

**\_ Encourage sustainable practices by individuals**

Minimize waste **17**

Reuse or recycle waste

Protect and conserve water

Use alternative fuel vehicles (hybrid-electric, biodiesel, ultra-low sulfur diesel) **18**

Carpool **19**

Schedule activities efficiently so as to minimize travel to and from the site

**FIELD INVESTIGATIONS**

**\_ Mobilization**

Use fuel-efficient / alternative fuel vehicles and equipment **18**

Use existing roadways where available

Provide for erosion and sediment control to minimize runoff into environmentally sensitive areas

Use recycled material for building roadways **21, 22, 23**

Revegetate areas if necessary

**\_ Demolition of on-site structures**

Minimize demolition of structures and buildings

Recycle demolition and construction material as possible **21, 22, 23**

**\_ Field Screening**

Use non-invasive technologies where possible for subsurface characterization to minimize wastes (Electrical Resistivity Tomography, Borehole Radar Tomography, Ground-Penetrating Radar, Seismic Refraction/Reflection, Electromagnetic Survey). **24, 25, 26**

Incorporate systematic planning, dynamic work strategies, and real-time measurements into work plans (TRIAD) to promote efficiency in remedial investigations. **27**

Avoid environmentally sensitive areas and cutting native trees/vegetation when placing trailers and storage areas, and while building access

Use diesel engines that meet the most stringent EPA on-road emissions standards available at the time of project's implementation or utilize EPA or CARB verified emission control technology to reduce PM emissions by a minimum of 85% when technologically feasible on all on-road diesel engines. **20**

Minimize number of field mobilizations

Minimize number of samples sent to laboratories

Use of mobile laboratories

Use of alternate fuel sources

**Drilling**

Have idle reduction policy and idle reduction devices installed on machinery **28**

Use ultra-low sulfur diesel and/or fuel-grade biodiesel as fuel **29, 30, 31, 32, 33, 34**

Engine Maintenance **36**

***EPA Region 2  
Green Site Assessment and Remediation Checklist  
Superfund Remedial Investigation/Feasibility Study Activities***

Perform routine inspections  
Conduct preventative maintenance  
Give problems immediate attention  
Perform routine cleaning  
Use environmentally friendly lubricants if applicable  
Decontamination  
Place decontamination station away from environmentally sensitive areas  
Use secondary containment to avoid cross contamination  
Use steam cleaning where allowed by federal/state/or local regulations  
Use non-phosphate detergents  
Well Installation  
Use recycled well materials where possible (well caps, etc.)  
Manage use of cement/grout to minimize waste produced  
Ensure wells are properly developed to increase efficiency  
Waste Management  
Use direct-push rig if applicable to minimize drill cuttings  
Place drill cuttings back in boring if applicable  
Store drill cuttings away from surface water bodies to prevent cross-contamination  
Dispose of drill cuttings at recycling facility if possible  
Use diesel engines that meet the most stringent EPA Tier non-road emissions standards available at the time of project's implementation or utilize EPA or CARB verified emissions by a minimum of 85% when technologically feasible on all non-road diesel vehicles. **35**

**– Sampling**

**General practices**

Use environmentally friendly PPE if applicable  
Use recycled laboratory containers if applicable  
Use laboratories which promote green chemistry  
Schedule sampling to minimize field visits and shipping  
Consider all data needs for any potential future uses

**Soil Sampling**

Use sampling methods that require smaller amounts of soil to minimize waste  
Dispose of waste properly to avoid cross contamination  
Recycle soil waste if available

**Groundwater sampling**

Use passive groundwater samplers where applicable **37, 38**  
Use eco-friendly bailers **39**  
Use dedicated equipment to minimize waste and cross-contamination  
Use remote data collection to minimize mobilizations  
Treat and recycle purged water on-site

**Surface Water sampling**

Choose sampling locations that minimize ecological disturbance  
Use dedicated sampling equipment to minimize waste and cross-contamination

**EPA Region 2**  
**Green Site Assessment and Remediation Checklist**  
**Superfund Remedial Investigation/Feasibility Study Activities**

**TREATABILITY INVESTIGATIONS/FEASIBILITY STUDIES**

**\_ Treatability Investigations (Bench-Scale, Pilot-Scale)**  
**\_ Analysis of Alternatives in the FS and Green Remediation Best Management Practices (BMPs)**

Evaluate "net environmental benefit as part of the nine criteria review process **2**

Decontaminate equipment away from surface water body to avoid contamination due to runoff

The evaluation of laboratory sub-contractors should include their commitment to green chemistry. The purpose is to reduce the amount and toxicity of chemicals used and required to be disposed. **40, 41**

Consider future use of site in determining the short and long-term effectiveness of the remedy

If one remedy has a vendor within the state but another remedy will require shipping equipment from another region, then the first remedy is more easily implementable AND may have a lower environmental footprint (through reduced transportation).

Evaluate energy efficiency (amount of energy necessary to remove one pound of contaminant) of each alternative over the projected lifecycle of the alternative.

Evaluate water intensity (amount of water necessary to remove one pound of contamination) **2**

Focus on minimizing high quality fresh water use

Assess the use of reclaimed water where applicable, e.g., for irrigation

Use native vegetation that requires little or no irrigation

Assess the best estimate of the cost of the energy projected out 30 years

Evaluate water intensity (amount of water necessary to remove one pound of contamination) **2**

Focus on minimizing high quality fresh water use

Assess the use of reclaimed water where applicable, e.g., for irrigation

Use native vegetation that requires little or no irrigation

Consider Green Remediation Best Management Practices for site restoration

Low-Impact Development (LID) - stormwater management **43**

Ecorestoration (increased wildlife habitat, increased carbon sequestration, protection of water resources, etc).

Greenscaping **44**

Encourage development of renewable energy production facilities on contaminated lands

Evaluate soil intensity of each alternative (amount of soil necessary to be displaced or disturbed to remove one pound of contaminant) **2, 42**

Incorporate green remediation best practices for each remedy considered as part of cost evaluation

Incorporate green remediation best practices for each remedy considered as part of cost evaluation

Analyze the feasibility of alternate energy sources for the required energy, e.g., solar, wind, biodiesel, etc.

Evaluate low-energy remedial alternatives, e.g., MNA, phytoremediation, micro-bioremediation, etc.; low energy use will be one of the factors weighed against the projected time for remediation

Minimize use of fertilizer, pesticides, herbicides, and other chemicals to prevent nutrient loading and toxicity impacts to nearby water bodies

Evaluate material intensity of each alternative (amount of raw materials extracted, processed, or disposed for each pound of contaminant treated) **2**

Minimize use of fertilizer, pesticides, herbicides, and other chemicals to prevent nutrient loading and toxicity impacts to nearby water bodies

**REFERENCES**

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2. <http://www.clu-in.org/download/remed/Green-Remediation-Primer.pdf>
3. <http://www.arnet.gov/far/current/html/FARTOCP23.html#wp227606>
4. <http://www.epa.gov/opptintr/epp/>

**EPA Region 2**  
**Green Site Assessment and Remediation Checklist**  
**Superfund Remedial Investigation/Feasibility Study Activities**

5. <http://www.epa.gov/otaq/diesel/construction/documents/cl-nedc-model.pdf>
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